

## **Remarks and Arguments**

### **The Rejection Under 35 U.S.C. §112, Second Paragraph**

The Examiner has rejected Claim 1 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claim 1 has been amended to delete the reference to step (d) and also to replace "zone" with "stage" for consistency. In view of the claim amendments, Applicants respectfully submit that this rejection has been overcome and that the claim terms now fully comply with §112.

### **The Rejection Under 35 U.S.C. §103(a)**

The Examiner has rejected Claims 1-28 under 35 U.S.C. §103(a) as being unpatentable over Housley et al. (US 2001/0007910) in view of Baldwin et al. (U.S. Patent No. 3,092,658). Applicants respectfully traverse the Examiner's rejection.

Applicants agree with the Examiner that the instant invention differs from Housley et al. "in that 7 to 60 wt percent of the one disubstituted benzene is introduced, [and] the claimed temperature in the first oxidation stage is at least 5.5 °F lower than that in the second oxidation stage." However, Applicants' invention differs from Housley et al. in several other respects as well.

For instance, in Housley et al., a process is disclosed for producing a carboxylic acid or its ester by the oxidation of a corresponding precursor at a pressure of least 2,000 kPa (approximately 275 psig). Housley et al. also teach employing a higher pressure in the first reaction zone so that the reaction medium can be readily fed to the second reaction zone. In contrast, Applicants' process operates at a much lower pressure and uses a lower pressure in the first oxidation stage (about 130 to about 215 psig), as well as a pump to transfer the first product mixture to the higher-pressure (about 170 to about 235 psig) second oxidation stage. (See, e.g., page 8, lines 17-22 and page 9, lines 14-21 of the specification). This allows the residual oxygen from the second oxidation stage to be recycled to the first oxidation stage without any additional processing equipment and provides for high oxygen utilization, a major advantage of Applicants' invention. Housley et al. neither teach nor suggest recycling unreacted

oxygen from the second oxidation stage to the first oxidation stage to obtain high oxygen utilization.

Also, in contrast to the present invention, neither Housley et al. nor Baldwin et al. disclose a process which introduces at least a portion of the condensed solvent from the first oxidation stage into the second oxidation stage. By sending a portion of the condensed solvent to the second oxidation stage, Applicants' process can run at a high enough catalyst concentration in the first oxidation stage to achieve the desired vent oxygen levels. Thus, neither Housley et al. nor Baldwin et al. teach or suggest a process which can maximize oxygen utilization.

Furthermore, Baldwin et al. disclose a process which calls for introducing the total amount of feed mixture into a first oxidation stage. Unlike Applicants' invention, Baldwin et al. do not teach or suggest a process whereby a portion or all of the total amount of the feed mixture is introduced into a second oxidation stage. By introducing a portion of the feed mixture into the second oxidation stage, Applicants can control the vent oxygen such that low terephthalic acid color is obtained. As illustrated in Table 7 of Applicants' patent application, the color of the terephthalic acid product from Comparative Example A (which is the Baldwin et al. process configuration whereby all of the feedstock is fed to the first reactor which operates with high oxygen utilization) is very high (1.790) and significantly exceeds the color obtained from all of the other Examples of the present invention.

Accordingly, there would be no incentive for one skilled in the art to combine the teachings of Baldwin et al. into the Housley et al. process in order to obtain Applicants' inventive process which achieves both high oxygen utilization and low terephthalic acid product color.

**Conclusion**


The Applicants respectfully request that the Examiner consider the foregoing arguments and amendments. Applicants submit that the subject claims are now in condition for allowance and respectfully request allowance of these claims.

If the Examiner again rejects these claims, he is respectfully requested to call Applicants' attorney before issuing the rejection so that the patentable nature of the invention may be further discussed.

May 10, 2007

Respectfully submitted,

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